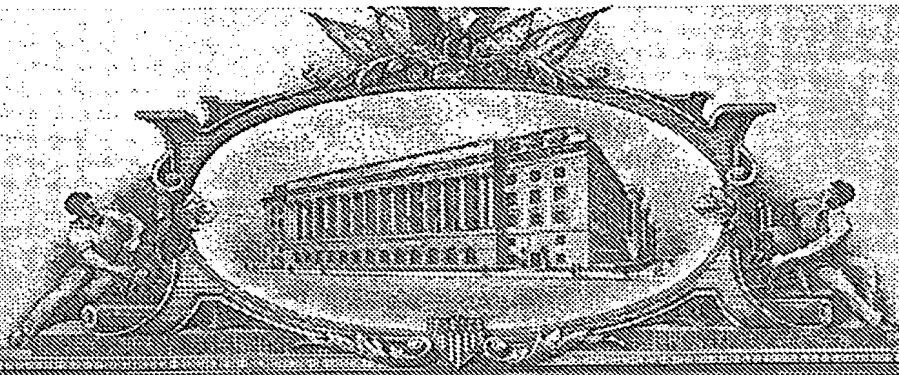


1229622



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

*September 23, 2004*

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: 60/494,491

FILING DATE: *August 12, 2003*

RELATED PCT APPLICATION NUMBER: *PCT/US04/26322*

Certified by

Jon W Dudas

Acting Under Secretary of Commerce  
for Intellectual Property  
and Acting Director of the U.S.  
Patent and Trademark Office



## PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. EV223958285US

INVENTOR(S)					
Given Name (first and middle (if any))	Family Name or Surname	Residence (City and either State or Foreign Country)			
James Daniel Larry	Asbury Kocher	New Hudson, Michigan Canton, Michigan			
Additional inventors are being named on the _____ separately numbered sheets attached hereto					
TITLE OF THE INVENTION (500 characters max)					
VEHICLE PANEL WITH METALIZED FILM					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
<input checked="" type="checkbox"/> Customer Number: 10291					
OR Customer Number					
<input checked="" type="checkbox"/> Firm or Individual Name Peter J. Rashid RADER, FISHMAN & GRAUER PLLC					
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Country US		Telephone (248) 594-0600	Fax (248) 594-0610		
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages 6		<input type="checkbox"/> CD(s), Number			
<input checked="" type="checkbox"/> Drawing(s) Number of Sheets 1		<input type="checkbox"/> Other			
<input checked="" type="checkbox"/> Application Data Sheet. See 37 CFR 1.76		(specify):			
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.					
<input type="checkbox"/> A check or money order is enclosed to cover the filing fees.					
<input checked="" type="checkbox"/> The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 18-0013					
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.					
FILING FEE AMOUNT (\$) 160.00					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are:					

[Page 1 of 1]

Respectfully submitted,

SIGNATURE

*Peter J. Rashid*

Date August 12, 2003

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PRINTED NAME

Peter J. Rashid

REGISTRATION NO.  
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39,464

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(248) 594-0624

Docket Number:

65961-0114

**USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT**

Provisional Patent Application Transmittal	
I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. EV223958285US, in an envelope addressed to: MS Provisional Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.	
Dated: August 12, 2003	Signature: <i>Julie A. Barber</i> (Julie A. Barber)

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**FEE TRANSMITTAL  
for FY 2003**

Effective 01/01/2003, Patent fees are subject to annual revision.

**Complete if Known**

Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	James D. Asbury
Examiner Name	Not Yet Assigned
Art Unit	N/A
Attorney Docket No.	65961-0114

☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT (\$)** 160.00**METHOD OF PAYMENT (check all that apply)**☐ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None☒ Deposit Account

Deposit Account Number

18-0013

Deposit Account Name

Rader, Fishman &amp; Grauer PLLC

The Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments☒ Charge any additional fee(s) during the pendency of this application☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	750	2001	375	Utility filing fee	
1002	330	2002	165	Design filing fee	
1003	520	2003	260	Plant filing fee	
1004	750	2004	375	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	160.00
<b>SUBTOTAL (1)</b>				<b>(\$)</b>	<b>160.00</b>

**2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE**

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	** =	x	=
Multiple Dependent	** =	x	=

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	84	2201	42	Independent claims in excess of 3
1203	280	2203	140	Multiple dependent claim, if not paid
1204	84	2204	42	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent
<b>SUBTOTAL (2)</b>				<b>(\$)</b> 0.00

\*\*or number previously paid, if greater; For Reissues, see above

**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for <i>ex parte</i> reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1806	1,840*	1806	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	410	2252	205	Extension for reply within second month	
1253	930	2253	465	Extension for reply within third month	
1254	1,450	2254	725	Extension for reply within fourth month	
1255	1,970	2255	985	Extension for reply within fifth month	
1401	320	2401	160	Notice of Appeal	
1402	320	2402	160	Filing a brief in support of an appeal	
1403	280	2403	140	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,300	2453	650	Petition to revive - unintentional	
1501	1,300	2501	650	Utility issue fee (or reissue)	
1502	470	2502	235	Design issue fee	
1503	630	2503	315	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	750	2809	375	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	750	2810	375	For each additional invention to be examined (37 CFR 1.129(b))	
1801	750	2801	375	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

\*Reduced by Basic Filing Fee Paid

**SUBTOTAL (3)** (\$)**SUBMITTED BY**

Name (Print/Type) Peter J. Rashid

Registration No. 39,464

**Complete (if applicable)**

Telephone (248) 594-0624

Signature

Date

August 12, 2003

**Fee Transmittal**

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Dated: August 12, 2003

Signature:

(Julie A. Barber)

Application No. (if known):

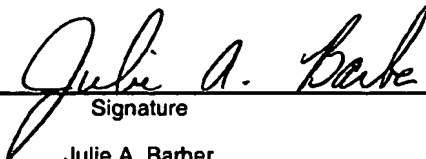
Attorney Docket No.: 65961-0114

## Certificate of Express Mailing Under 37 CFR 1.10

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MS Provisional Patent Application  
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Alexandria, VA 22313-1450

on August 12, 2003  
Date



Signature

Julie A. Barber

Typed or printed name of person signing Certificate

**Note:** Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

Application Data Sheet

**VEHICLE PANEL WITH METALIZED FILM**

**BACKGROUND OF THE INVENTION**

**Field of the Invention**

[0001] The present invention relates in general to a vehicle panel structure, and in particular to a vehicle panel structure that includes a core layer and a layer of metalized film to provide the vehicle panel structure with improved thermal properties.

**Description of the Related Art**

[0002] Typically, a vehicle panel, such as a headliner, includes an air gap between the vehicle roof and the headliner to provide a thermal barrier between the vehicle roof and the headliner. Unfortunately, one problem associated with the necessity of this air gap is that the overall distance between the vehicle roof and the headliner is increased.

**SUMMARY OF THE INVENTION**

[0003] The inventor of the present invention has recognized these and other problems associated with conventional vehicle panels, and have developed a vehicle panel comprising a core layer and a layer of metalized film. The layer of metalized film eliminates the need for an air gap between two layers of material, such as a vehicle roof and a headliner, thereby minimizing the thickness of the vehicle panel while improving thermal performance of the vehicle panel structure. Thus, the vehicle panel of the invention comprises a core layer, and a layer of metalized film bonded to the core layer. Preferably, the material for the core layer is compatible with the material for metalized film such that the metalized film is bonded to the core layer with the application of heat. Alternately, a bonding agent may be applied to either the core layer or the metalized film that is compatible to the materials used for the core layer and the metalized film to form the appropriate bond between the core layer and the metalized film upon the application of heat.

[0004] A method of manufacturing the vehicle panel comprises the steps of positioning the core layer on a surface of a mold half, and positioning the metalized film on the surface of the other mold half. After placing the core layer and the metalized film, heat is applied to either the core layer or the metalized film by heating the core layer or heating the mold half with the metalized film for a predetermined temperature. Then, the mold halves are closed to press the cover layer against the metalized film for a predetermined period of time. As the metalized film is heated, the metalized film becomes formable and is bonded to the surface of the cover layer to form the vehicle panel. The mold halves are then opened and the vehicle panel is removed.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

[0005] In the drawings:

[0006] The Figure shows a cross-sectional view of a vehicle panel structure including a core layer and a layer of metalized film according to an embodiment of the invention.

#### **DESCRIPTION OF THE PREFERRED EMBODIMENT**

[0007] Referring now to the Figure, a vehicle panel 10 is shown according to an embodiment of the invention. The vehicle panel 10 includes a core layer 12 and a layer of metalized film 14 bonded to the core layer 12. Optionally, the vehicle panel 10 may include a second layer of metalized film or suitable material (not shown), such as a fabric, bonded or otherwise attached to the opposite surface of the core layer 12.

[0008] The core layer 12 may be made of any desirable material. Preferably, the core layer 12 is comprised of any suitable material having insulating properties. For example, the core layer 12 may comprise a foam material, such as polypropylene or the like, and have a density and thickness that may vary depending on the design requirements.

[0009] The metalized film 14 may be made of any type of material that is capable of reflecting heat, such as polyethylene terephthalate (PET) or the like. Preferably, the material used for the metalized film 14 is compatible with the material used for the

core layer 12 such that the metalized film 14 can form a bond with the core layer 12. One suitable material for the metalized film 14 is commercially available under the trade name METALLYTE™ MET available from ExxonMobil Chemical. The metalized film 14 contains a polymer material, such as polypropylene or the like, that is compatible with the material for the cover layer 12. In addition, the metalized film 14 is coated with a metallic material, such as aluminum or the like, that has excellent heat reflection properties.

[0010] Ideally, the metalized film 14 is bonded to the outer surface of the core layer 12 that is nearest the source of heat to be reflected by the vehicle panel 10. If necessary, a second layer of metalized film 14 or other suitable material can be applied to an opposite surface of the core layer 12 in situations where the source of heat is emanating from opposite sides of the core layer 12. However, in most situations, the core layer 12 is exposed to only one heat source, and therefore only one layer of metalized film 12 is required for adequate heat reflection.

[0011] For example, the core layer 12 with metalized film 14 can be used as a headliner of a vehicle. In this example, the source of heat (indicated by the arrows in the Figure) would be the vehicle roof so the metalized film 14 would be applied to only one surface of the core layer 12 that is nearest the vehicle roof. It has been found that when the core layer 12 with metalized film 14 positioned nearest the vehicle roof is used as a headliner that the headliner exhibits superior heat reflection and heat absorption properties, as compared to conventional headliners that require the air gap between the headliner and the vehicle roof for insulation. Thus, the vehicle panel 10 comprising the core layer 12 with metalized film 14 eliminates the need of an air gap. As a result, the vehicle panel 10 when used as a headliner requires less real estate (i.e. has less thickness) as compared to conventional headliners with an air gap.

[0012] A method for manufacturing the vehicle panel 10 will now be described. Typically, a mold tool (not shown) includes two mold halves. It is understood that the mold halves have complimentary shapes in the shape of the vehicle panel to be formed. The cover layer 12 is positioned in one mold half using conventional means. The metalized film 14 is positioned on the other mold half using conventional means, such as tenured, pinned, clamped, vacuumed, or the like, in a manner known in the

art. The cover layer 12 is then heated to a predetermined temperature, such as approximately 400 degrees Fahrenheit to cause the cover layer 12 to be in a somewhat molten state. The mold halves are then closed together to press the cover layer 12 in engagement with the metalized film 14 for a predetermined period of time, such as approximately 30 seconds. When the mold halves are pressed together, some of the heat from the cover layer 12 is transferred to the metalized film 14 such that the metalized film 14 becomes formable and molded to the shape of the cover layer 12. The source of heat being transferred to the metalized film 14 can be from other sources of heat, such as the mold tool itself, rather than from the cover layer 12.

[0013] It should be noted that the topography of the cover layer 12 and the vehicle panel 10 is non-flat. In these cases, it has been found that the metalized film 14 may become wrinkled in locations where the cover layer 12 may have a non-flat topography. However, the metalized film 14 having a substantially flat surface before being placed in the mold half still provides an acceptable bond to the entire surface of the cover layer 12 because the metalized film 14 is placed in the mold half with enough tolerance to substantially conform to the topography of the cover layer 12 and the vehicle panel 10 being formed.

[0014] While the invention has been specifically described in connection with certain specific embodiments thereof, it is to be understood that this is by way of illustration and not of limitation, and the scope of the appended claims should be construed as broadly as the prior art will permit.



**CLAIMS**

What is claimed is:

1. A vehicle panel, comprising:  
  
a core layer, and  
  
a layer of metalized film bonded to said core layer.
2. The vehicle panel of Claim 1, wherein said layer of metalized film is made of a material that is compatible with said core layer.
3. The vehicle panel of Claim 2, wherein said layer of metalized film comprises polyethylene terephthalate (PET).
4. The vehicle panel of Claim 1, wherein said core layer is made of an insulating material.
5. The vehicle panel of Claim 4, wherein said core layer comprises polypropylene material.
6. The vehicle panel of Claim 1, wherein said vehicle panel comprises a headliner.
7. A method of manufacturing a vehicle panel, comprising the steps of:  
  
positioning a core layer on a first mold half of a mold tool;  
  
positioning a metalized film on a second mold half of the mold tool;  
  
applying heat to the core layer; and  
  
5 closing the first and second mold halves such that the heat from core layer is transferred to the metalized film, whereby the metalized film becomes formable and is capable of being bonded to the core layer.

**VEHICLE PANEL WITH METALIZED FILM**

**ABSTRACT OF THE DISCLOSURE**

A vehicle panel includes a core layer and a layer of metalized film bonded to the core layer. In one embodiment, the core layer is made of a material with heat absorption or insulation properties. The layer of metalized film is made of a material having heat reflective properties that can be bonded to the core layer. Alternatively, a compatible bonding agent can be applied to the core layer, the metalized film or both. To form the vehicle panel, the layer metalized film is positioned on one half of a mold tool and the core layer is positioned on the other half of the mold tool. Heat is applied to the core layer and the mold tool is closed such that the heat from the core layer causes the metalized film to be in a formable state.

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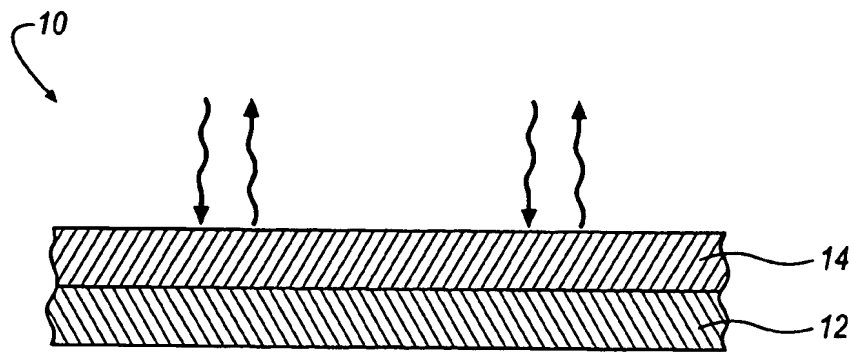


FIG. 1

## **Application Data Sheet**

### **Application Information**

Application Type::	Provisional
Subject Matter::	Utility
Suggested Group Art Unit::	N/A
CD-ROM or CD-R?::	None
Sequence submission?::	None
Computer Readable Form (CRF)?::	No
Title::	VEHICLE PANEL WITH METALIZED FILM
Attorney Docket Number::	65961-0114
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	1
Small Entity?::	No
Petition included?::	No
Secrecy Order in Parent Appl.?::	No

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**Representative Information**

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